

IPv6 Application of the Alternate Marking Method

draft-fz-6man-ipv6-alt-mark-07

Virtual Meeting, Mar 2020, IETF 107

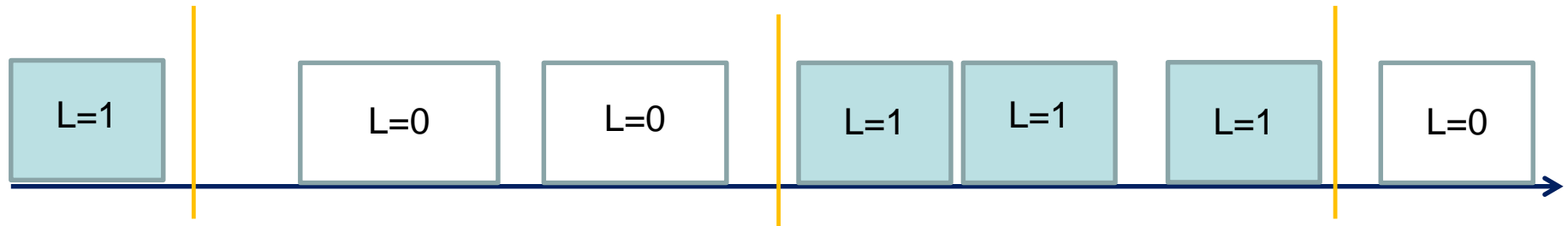
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Alternate Marking at a glance

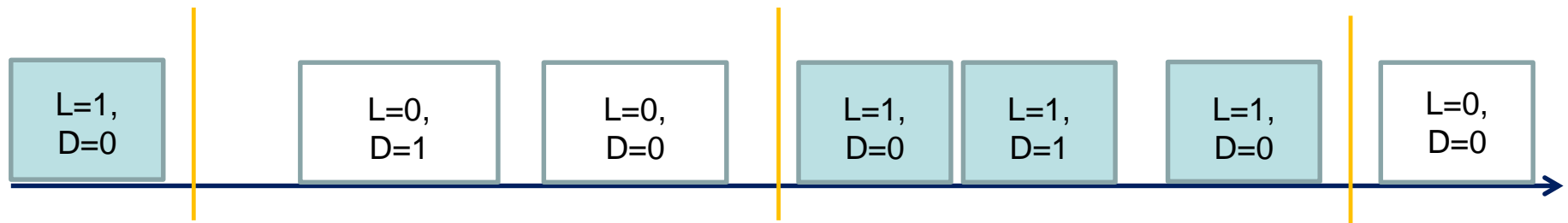
Alternate Marking methodology is an OAM PM technique and enables Packet Loss, Delay and Delay Variation measurements

The reference documents are **RFC 8321** and **draft-ietf-ippm-multipoint-alt-mark** (in RFC Editor Queue)

- Batching packets based on time interval to measure **Packet Loss** by switching value of L flag.
- **First/Last Packet Delay calculation** and **Average Packet Delay and Delay Variation** calculations are possible



- Use D flag to create a new set of marked packets fully identified over the network. D-marked packets to calculate **more informative Packet Delay Metrics**



What about IPv6

The main requirement for the application of the alternate marking is the **Marking Field**.

The alternatives that can be considered for the Marking Field were already analyzed in [draft-fioccola-v6ops-ipv6-alt-mark](#).

- The preferred choice is the use of the **Option Header** (Hop-by-hop or Destination)

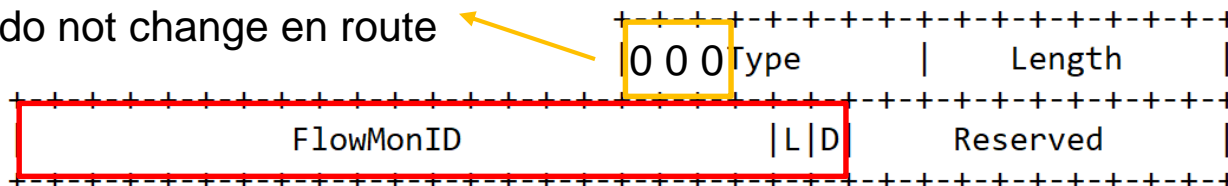
The Alternate Marking application to IPv6 is straightforward and does not affect the packet behavior:

- ✓ The **source node** is the only one that writes the Option Header to mark alternately the flow.
- ✓ The **intermediate nodes** may be configured to support this Option or not. Anyway this does not impact the traffic since the measurement can be done only for the nodes configured to read the Option.
- ✓ Alternate Marking method allows to perform both **end-to-end and hop-by-hop measurements**.

Generalized Alternate Marking Data Fields

- It is always better to generalize and define a new TLV to be encoded in the Options Header
- The **AltMark Option** is expected to be encapsulated as Hop-by-Hop Options Header or Destination Options Header.

Skip if do not recognize and data do not change en route



- **L** and **D** are the Marking Fields
- The Flow Monitoring Identification (**FlowMonID**) is required for some general reasons:
 - It helps to reduce the per node configuration.
 - It simplifies the counters handling especially in tunnel interfaces.
 - It eases the data export and correlation for the collectors.

AltMark: EH Option

Hop-By-Hop Options Header or Destination Options Header can be used based on the chosen type of performance measurement.

In summary, it is possible to list the alternative options:

- ✓ **Destination Option** => measurement only by node in Destination Address.
- ✓ **Hop-By-Hop Option** => every router on the path with feature enabled.
- ✓ **SRH TLV** => every node that is an identity in the SR path.
- ✓ **Destination Option + SRH** => every node that is an identity in the SR path.

The usage of SRH TLV is still under discussion within the community and so it is not the preferred solution.

In general, **HBH and Destination Options are the most suitable ways** to implement Alternate Marking

Changes from -01

- We got several comments on the mailing list

Thank you to Bob Hinden, Ole Troan, Tom Herbert, Stefano Previdi, Brian Carpenter for raising the discussion

Fruitful feedbacks and improvements to the document:

- Help to analyze how to encode the TLV for Alternate Marking application
 - Scope clarified and focus on IPv6 in general
 - Adjust the wording and update the references
- Definition of the three high-order bits of the Option Type in IANA Considerations Section
 - A new co-author has joined

Next Steps

- We have found an agreed way to apply RFC 8321 and draft-ietf-ippm-multipoint-alt-mark to IPv6
- Authors consider the draft ready for WG adoption
- Welcome questions, comments

Thank you